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Custer et al.

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(54) **BAND TIGHTENING SYSTEM**

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(22) Filed: **Mar. 15, 2014**

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(51) **Int. Cl.**

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G04B 37/22	(2006.01)
A44C 5/22	(2006.01)

(52) **U.S. Cl.**
CPC .. ***G04B 37/22*** (2013.01); *A44C 5/22* (2013.01)

(58) **Field of Classification Search**
CPC A43C 11/165; A44C 5/22; G04B 37/22
USPC 368/282
See application file for complete search history.

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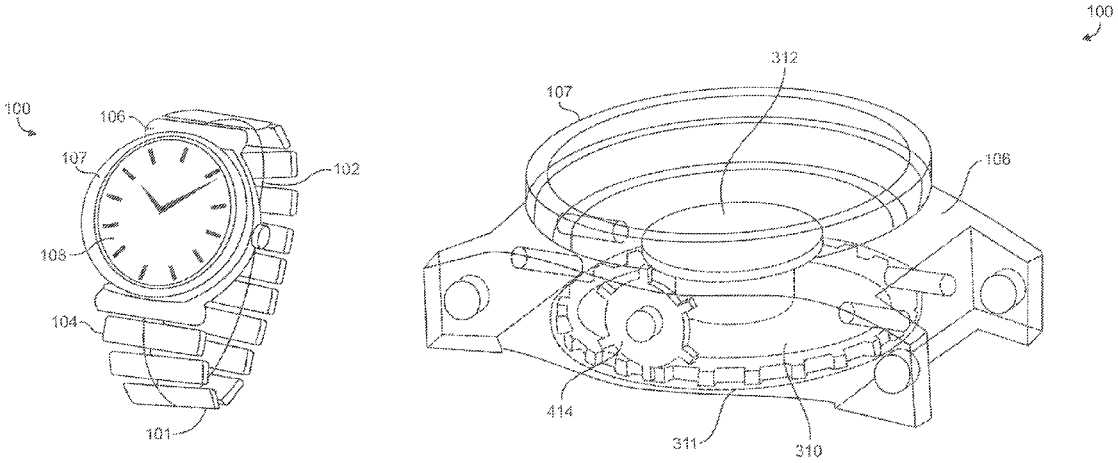
(57) **ABSTRACT**

The present disclosure generally relates to a tightening apparatus, a wristband having the same, and a wristwatch having the same. In one embodiment, a plurality of pieces are coupled together and to a housing, and have one or more wires running through at least a first piece and a second piece of the plurality of pieces. The first and second pieces of the plurality of pieces are spaced a distance apart. The housing partially encloses at least a ratchet having a center axis, and a spool coupled to the ratchet, the spool being rotatable about an axis that is collinear with the center axis. The one or more wires are coupled to the spool, and are configured to wind around the spool when the spool rotates. As the spool rotates, the distance between at least the first and second pieces of the plurality of pieces is reduced.

22 Claims, 8 Drawing Sheets



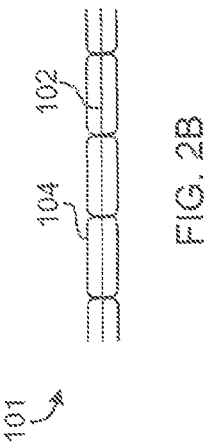


FIG. 2B

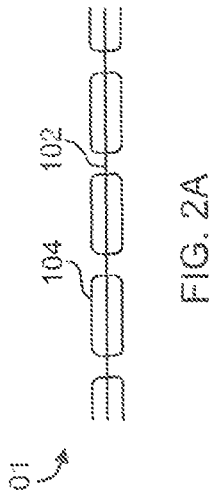


FIG. 2A

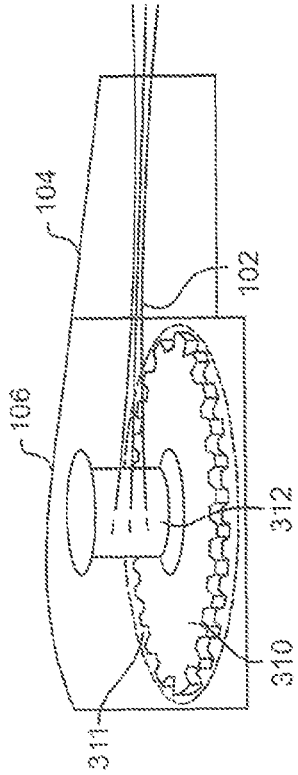


FIG. 3

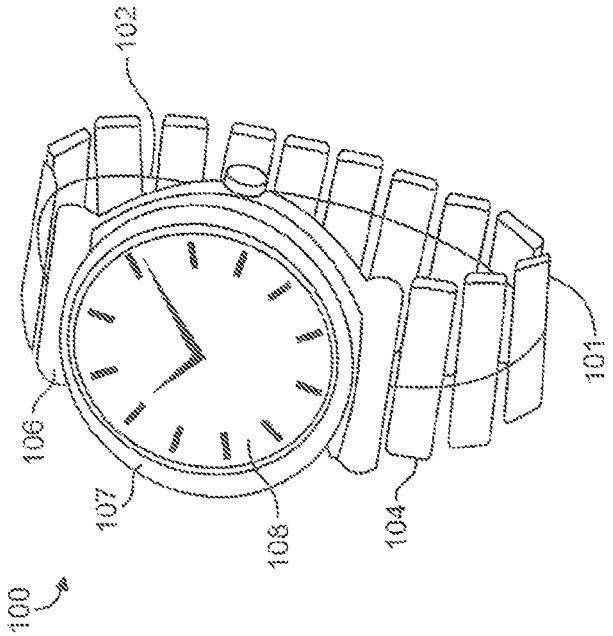


FIG. 1A

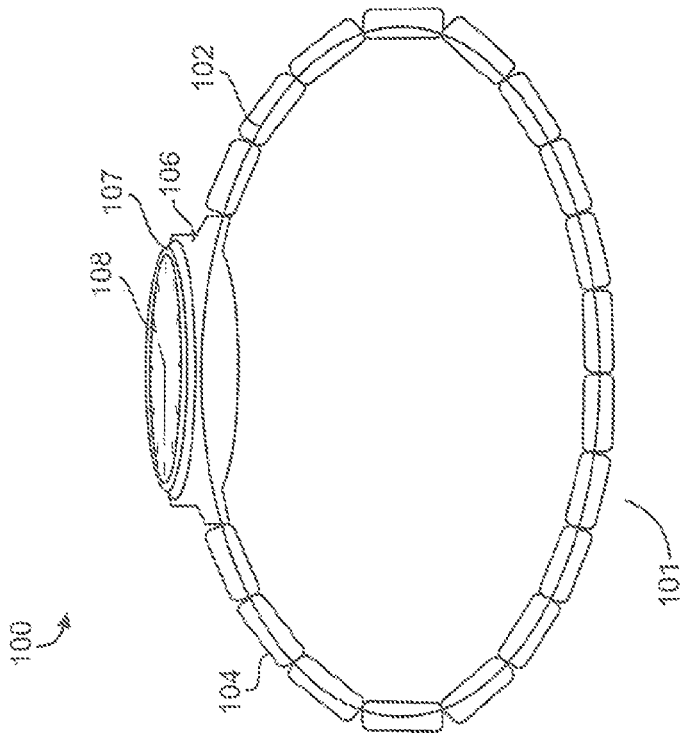


FIG. 1C

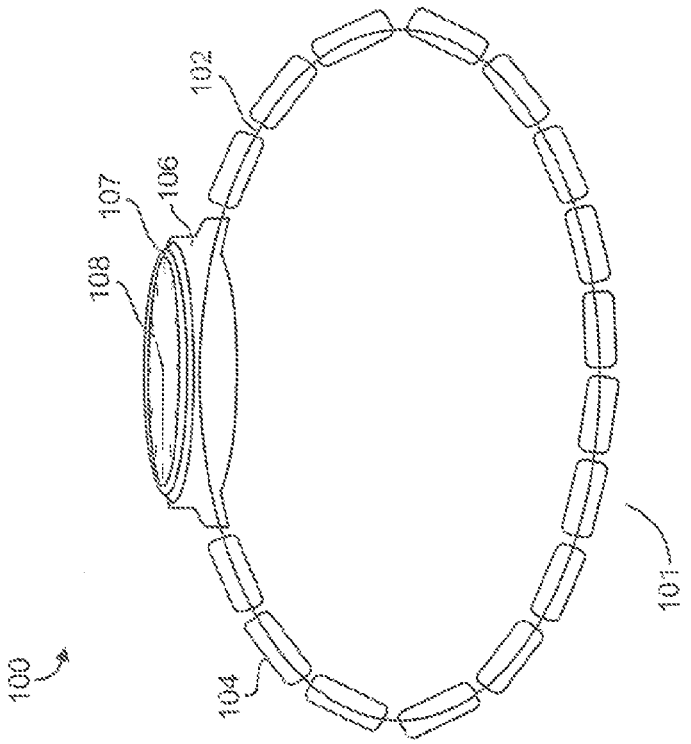


FIG. 1B

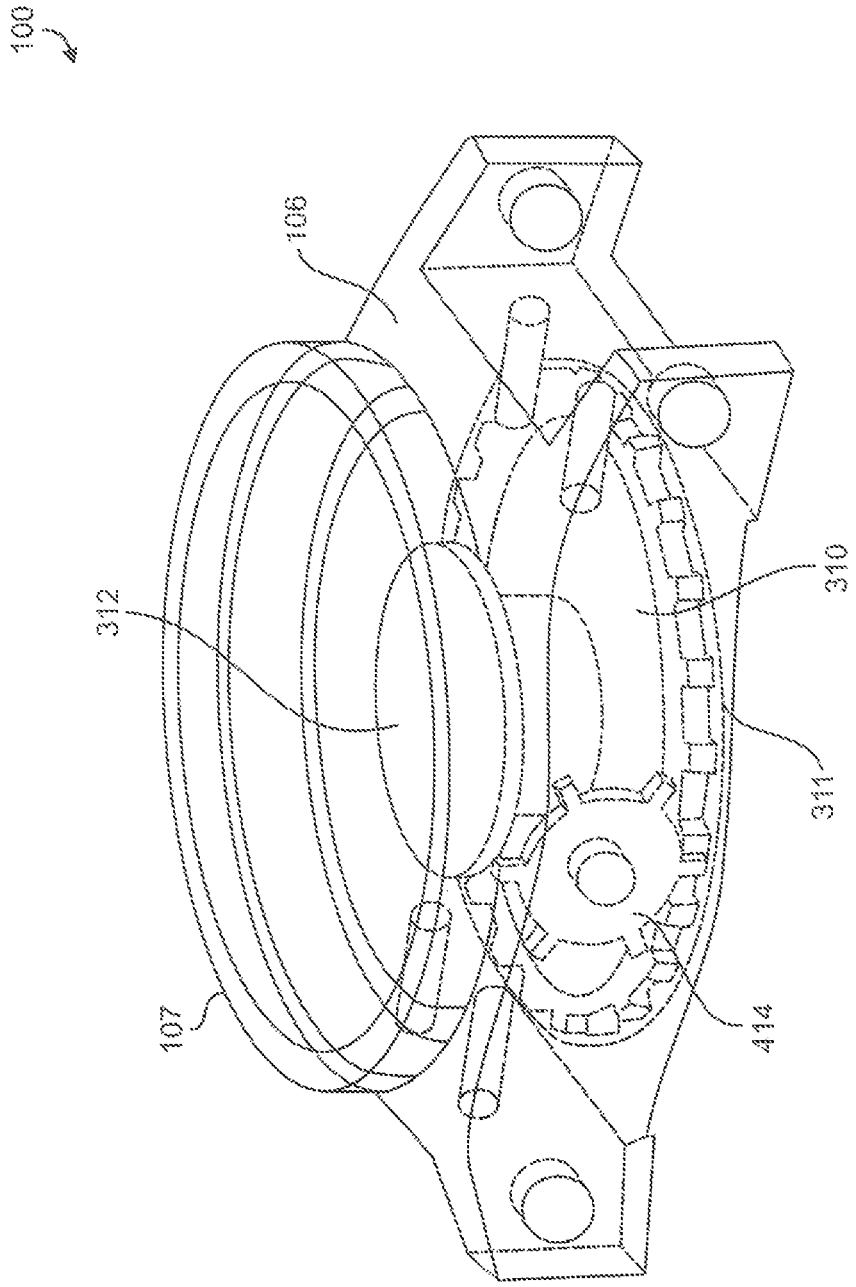


FIG. 4

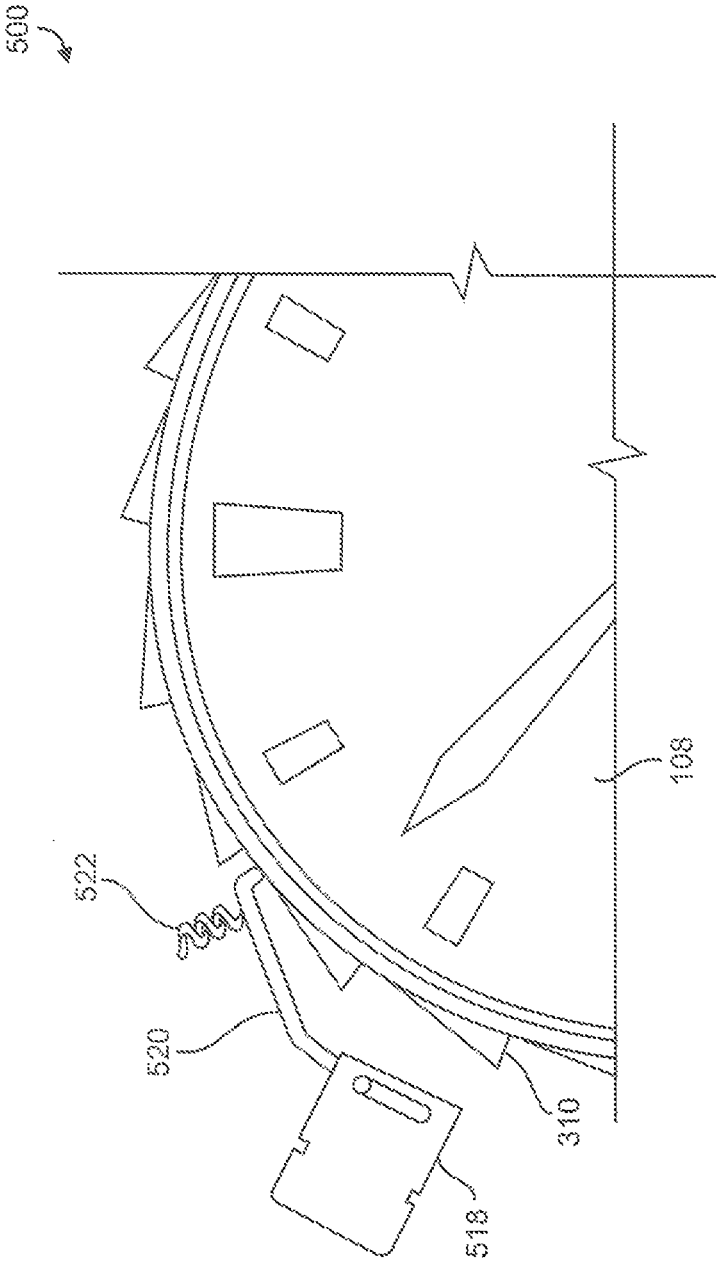


FIG. 5

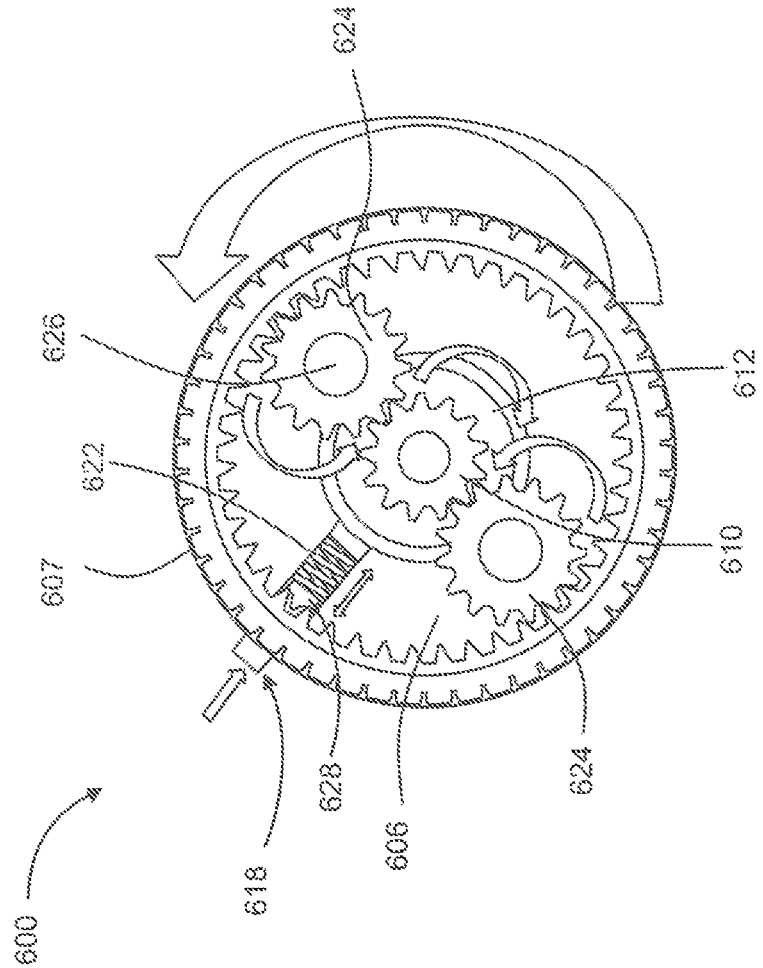


FIG. 6A

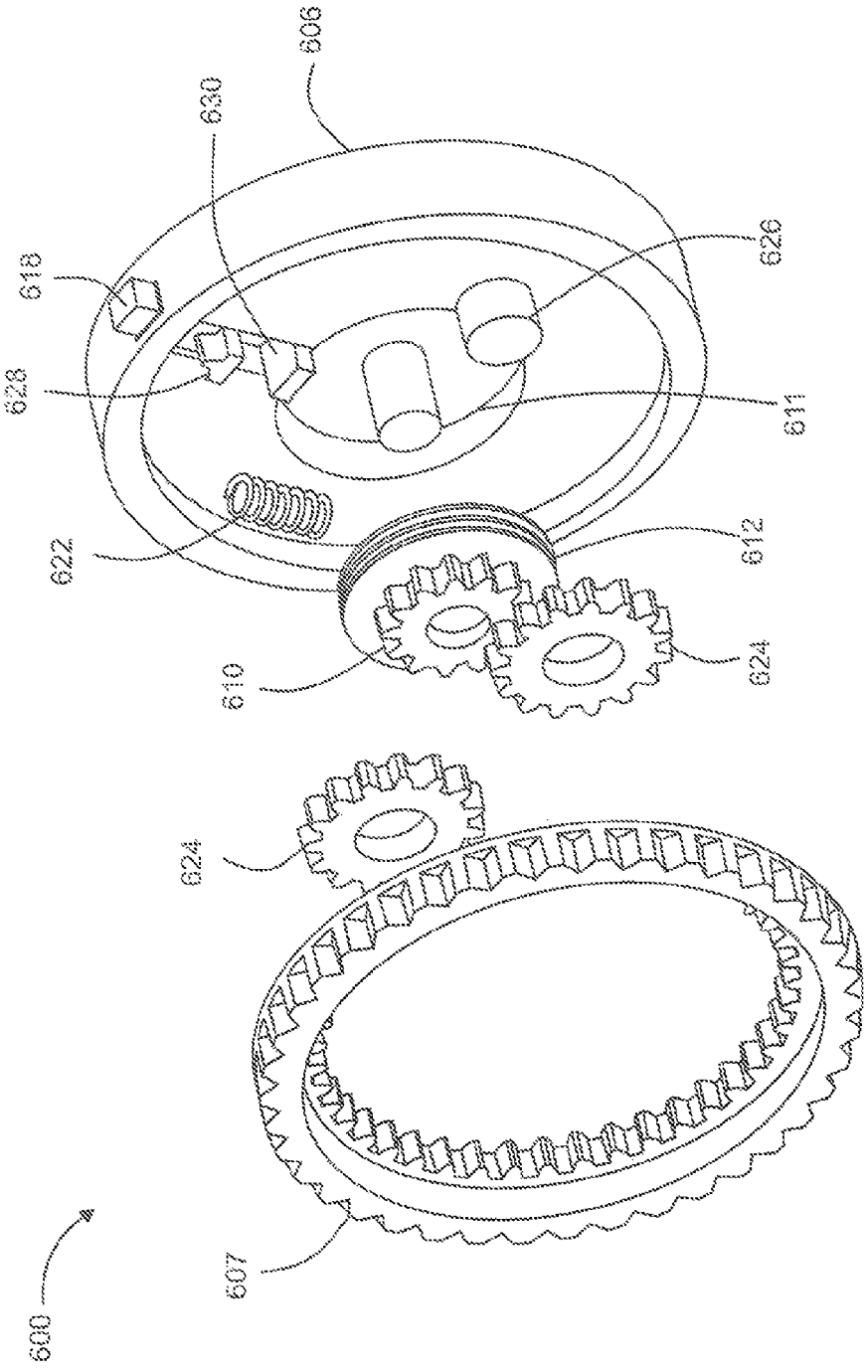


FIG. 6B

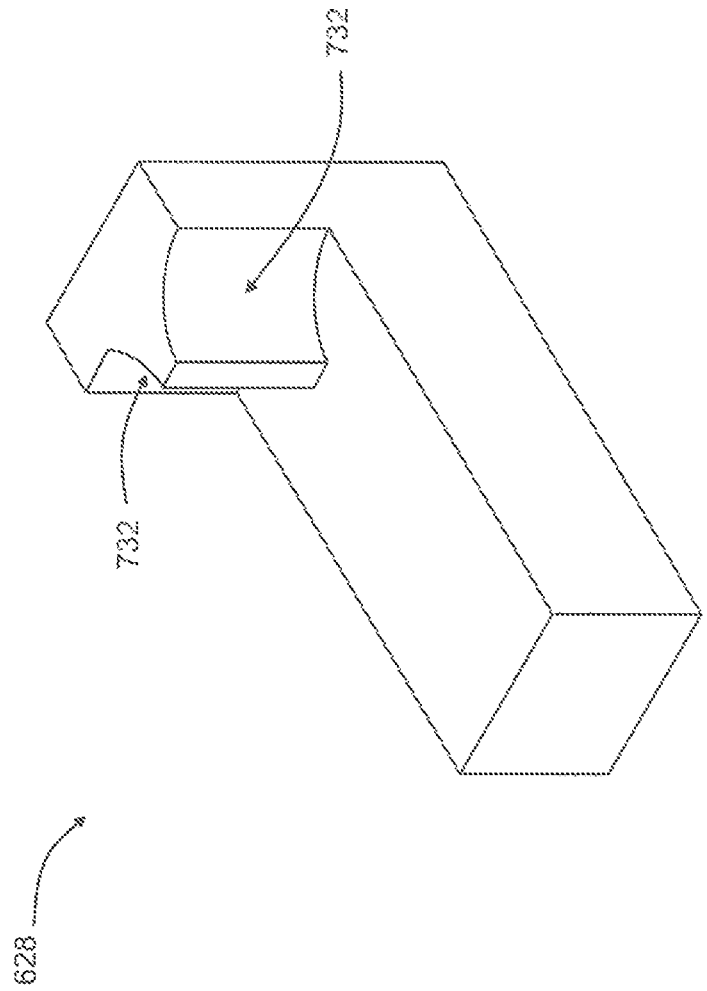


FIG. 7

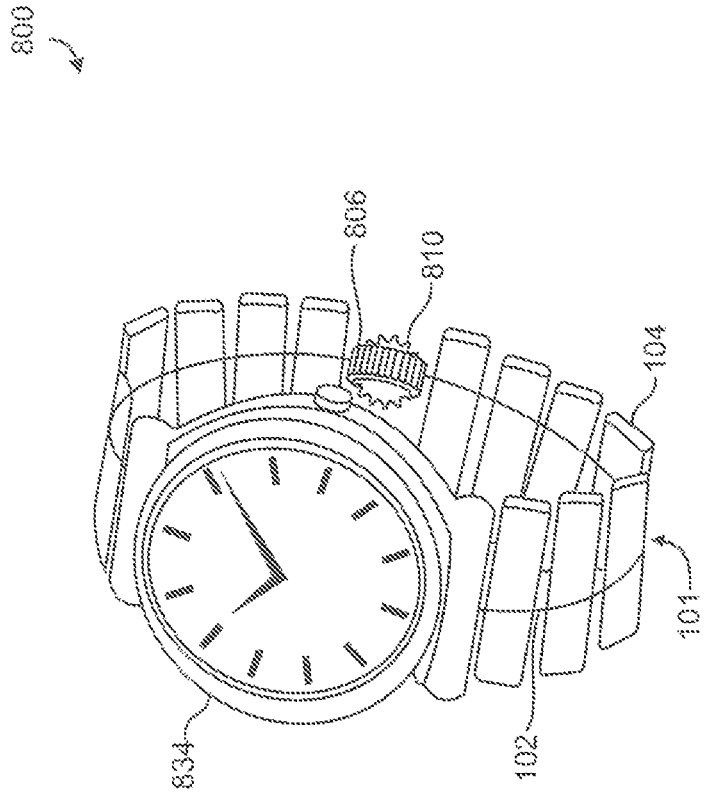


FIG. 8

BAND TIGHTENING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims benefit of U.S. Provisional Patent Application Ser. No. 61/799,592, filed Mar. 15, 2013, which is herein incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

Embodiments of the present invention generally relate to a tightening apparatus, a wristband having the same, and wristwatch having the same.

2. Description of the Related Art

In recent years, the popularity of technology and gadgets worn on the wrist has greatly increased. Examples of such technology and gadgets include watches, heart rate monitors, MP3 players, Fitbits, flash drives and mobile phones. As many of these gadgets are made to be worn all day or during vigorous exercise and activity, it is imperative that gadgets worn on the wrist fit tightly to work efficiently and correctly.

Often times, these gadgets are worn on the wrist by a band of connected metal links or a semi-circle band made of rubber. Rubber is known to stretch out over time and does not hold its elasticity, and the bands typically come in only one size. The individual metal links are removable to make the size of the wrist band customizable, but removing the links rarely makes the wrist band fit tightly and properly. Removing one too many links makes the wrist band too small to fit, or too tight to be comfortable. Not removing enough links makes the wrist band too large, and the gadget does not sit snugly or comfortably where it belongs. Additionally, a professional is often required to remove the links, thus, the links are not user adjustable and can be an inconvenience to be removed.

Therefore, there is a need in the art for an improved method and apparatus for modifying the size of a wrist band in order for the technology and gadgets worn on the wrist to work properly and to fit comfortably.

SUMMARY OF THE INVENTION

The present disclosure generally relates to a tightening apparatus, such as a wristband. In one embodiment, a plurality of pieces are coupled together and to a housing, and have one or more wires running through at least a first piece and a second piece of the plurality of pieces. The first and second pieces of the plurality of pieces are spaced a distance apart. The housing partially encloses at least a ratchet having a center axis, and a spool coupled to the ratchet, the spool being rotatable about an axis that is collinear with the center axis of the ratchet. The one or more wires are coupled to the spool, and are configured to wind around the spool when the spool rotates. As the spool rotates, the distance between at least the first and second pieces of the plurality of pieces is reduced.

In one embodiment, a tightening apparatus comprises a housing having a plurality of pieces coupled together, a ratchet having a center axis and coupled to at least a first piece of the plurality of pieces and a spool coupled to the ratchet, wherein the spool is rotatable about an axis that is collinear with the center axis of the ratchet. One or more wires are coupled to the spool and at least a second piece of the plurality of pieces. The one or more wires are configured to wind around the spool when the spool rotates, and the second piece is movable from a first position spaced a first distance from the first piece to a second position spaced a second distance from the first piece, wherein the second distance is less than the first distance.

In another embodiment, a tightening apparatus comprises a housing, a plurality of pieces coupled together and to the housing, a central sun gear having a center axis and a plurality of teeth, wherein the sun gear is enclosed in the housing, two planetary gears coupled to the sun gear, wherein the planetary gears have a plurality of teeth and are enclosed in the housing, and a spool coupled to the sun gear, wherein the spool is rotatable about an axis that is collinear with the center axis of the sun gear. A bezel having a plurality of teeth is interlocked with the teeth of the planetary gears, and three posts extending perpendicularly from the bottom of the housing are disposed centrally through the sun gear and the planetary gears. One or more wires are coupled to the spool and at least a second piece of the plurality of pieces. The one or more wires are configured to wind around the spool when the spool rotates. The second piece is movable from a first position spaced a first distance from a first piece of the plurality of pieces to a second position spaced a second distance from the first piece, and wherein the second distance is less than the first distance.

In another embodiment, a tightening wristwatch comprises a housing having a plurality of pieces coupled together, and a ratchet having a center axis and coupled to at least a first piece of the plurality of pieces and a last piece of the plurality of pieces, wherein the ratchet has a plurality of teeth. A spool is coupled to the ratchet, wherein the spool is rotatable about an axis that is collinear with the center axis of the ratchet. A cog is perpendicular to the ratchet, wherein the teeth of the cog and the teeth of the ratchet are interlocked. A bezel is perpendicular to the cog and parallel with the ratchet, and the cog and bezel are interlocked. A watch including a watch face is coupled to the bezel, wherein the watch is coupled to the plurality of pieces to form a closed loop. One or more wires are coupled to the spool and at least a second piece of the plurality of pieces. The one or more wires are configured to wind around the spool when the spool rotates, and the second piece is movable from a first position spaced a first distance from the first piece to a second position spaced a second distance from the first piece, wherein the second distance is less than the first distance, and wherein the diameter of the loop is reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

So that the manner in which the above recited features of the present invention can be understood in detail, a more particular description of the invention, briefly summarized above, may be had by reference to embodiments, some of which are illustrated in the appended drawings. It is to be noted, however, that the appended drawings illustrate only typical embodiments of this invention and are therefore not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

FIGS. **1**A-**1**C illustrate a band, according to one embodiment of the invention.

FIGS. **2**A-**2**B illustrate the band when the tightness is varied.

FIG. **3** shows an inside view of a housing.

FIG. **4** illustrate various components of the housing of a watch integrated with a band, according to embodiments of the invention.

FIG. **5** illustrates a release mechanism.

FIGS. **6**A-**6**B illustrate a planetary gear system, according to one embodiment of the invention.

FIG. **7** illustrates a linear stopper piece.

FIG. **8** illustrates a tightening apparatus, according to one embodiment of the invention.

To facilitate understanding, identical reference numerals have been used, where possible, to designate identical elements that are common to the figures. It is contemplated that elements disclosed in one embodiment may be beneficially utilized on other embodiments without specific recitation.

DETAILED DESCRIPTION

In the following, reference is made to embodiments of the invention. However, it should be understood that the invention is not limited to specific described embodiments. Instead, any combination of the following features and elements, whether related to different embodiments or not, is contemplated to implement and practice the invention. Furthermore, although embodiments of the invention may achieve advantages over other possible solutions and/or over the prior art, whether or not a particular advantage is achieved by a given embodiment is not limiting of the invention. Thus, the following aspects, features, embodiments and advantages are merely illustrative and are not considered elements or limitations of the appended claims except where explicitly recited in a claim(s). Likewise, reference to "the invention" shall not be construed as a generalization of any inventive subject matter disclosed herein and shall not be considered to be an element or limitation of the appended claims except where explicitly recited in a claim(s).

The present disclosure generally relates to a tightening apparatus, such as a wristband. In one embodiment, a plurality of pieces are coupled together and to a housing, and have one or more wires running through at least a first piece and a second piece of the plurality of pieces. The first and second pieces of the plurality of pieces are spaced a distance apart. The housing partially encloses at least a ratchet having a center axis, and a spool coupled to the ratchet, the spool being rotatable about an axis that is collinear with the center axis. The one or more wires are coupled to the spool, and are configured to wind around the spool when the spool rotates. As the spool rotates, the distance between at least the first and second pieces of the plurality of pieces is reduced.

FIG. **1**A illustrates an isometric view of a device **100** that includes a housing **106** and a band **101**, according to one embodiment. In the embodiment shown in FIGS. **1**A-**1**C, the device **100** is a wrist watch. It is to be understood that the device **100** is not limited to a wrist watch or to being a device worn on the wrist. The band **101** comprises a plurality of pieces **104** that are coupled together and to the housing **106**, where one or more wires **102** extend out from the housing **106** and run through the center of the plurality of pieces **104**. The plurality of pieces **104** may be spaced some distance apart from one another. The plurality of pieces **104** may comprise metal and may be linkage pieces. The plurality of pieces **104** may be coupled to the housing **106** on both ends to form a closed loop. In another embodiment, the plurality of pieces **104** may be coupled at only one end to the housing **106** while the other end is fixedly coupled to a piece of the plurality of pieces **104**. The one or more wires **102** may run through each piece of the plurality of pieces **104**, or the one or more wires **102** may only run though a few pieces of the plurality of pieces **104**.

FIG. **1**B shows a side view of the device **100** and the band **101**. In the embodiment shown in FIG. **1**B, the housing **106** is coupled to a watch face **108** and a bezel **107**. As shown, the one or more wires **102** are loose, and a number of the plurality of pieces **104** are spaced apart and are not in direct contact with one another, although two or more pieces of the plurality of pieces **104** may be in direct contact with one another. As noted above, the band **101** is not limited to being a band specific for a watch, but could simply be a wrist band without a watch attached. The plurality of pieces **104** that make up the band **101** could be adapted to receive different attachments, such as different gadgets not limited to GPS devices, medical alert emblems, etc.

FIG. **1**C shows a side view of the device **100** and the band **101** when the wire **102** is tightened. A number of the plurality of pieces **104** are in direct contact with one another, and the band **101** has a smaller diameter than the band **101** in FIG. **1**B. Each piece of the plurality of pieces **104** may be in direct contact with one another, or two or more pieces of the plurality of pieces **104** may be space apart from one another.

FIGS. **2**A-**2**B show the band **101** when the tightness of the wire **102** is varied. FIG. **2**A shows the wire **102** being slack. The plurality of pieces **104** are spaced apart from one another and the wire **102** may be visible between the pieces **104**. FIG. **2**B shows the wire **102** in a tightened state. The plurality of pieces **104** may all be in direct contact with one another, and the wire **102** may not be visible between the pieces **104**.

The housing **106** encloses at least a spool **312** coupled to a ratchet **310**, the ratchet **310** having a center axis and a plurality of teeth. The spool **312** extends perpendicularly from a surface of the ratchet **310**, and is rotatable about an axis that is collinear with the center axis. The one or more wires **102** are coupled to the spool **312** at one end. FIG. **3** shows a side view of the inside of the housing **106** and the one or more wires **102** coupled to the spool **312**. The ratchet **310** sits in a circular recess **311**, the recess **311** having a greater diameter than the ratchet **310**. The edge of the recess **311** prevents the wire **102** from contacting the teeth of the ratchet **310**. In one example, the spool **312** has a smaller diameter than the ratchet **310**. Any number of wires **102** may be coupled to the spool **312**, and one end of the one or more wires **102** may be fixedly coupled to an end piece of the plurality of pieces **104**. The spool **312** may be coupled to the surface of the ratchet **310** which faces the bezel **107**, or the spool **312** may be coupled to the surface of the ratchet **310** that faces the bottom of the housing **106**.

FIG. **4** illustrates the various components enclosed in a housing **106** of the device **100**, according to one embodiment. In this embodiment, the ratchet **310** is operatively coupled to the bezel **107** through a cog **414**. The cog **414** is perpendicular to the bezel **107** and may be coupled to the housing by a pin. The bezel **107** may have a plurality of teeth to facilitate operational rotation with the cog **414**, and may be coupled to the watch face **108** or other device. For example, the bezel **107** may be coupled to a heart rate monitor or an MP3 player. The bezel **107** and/or the cog **414** may be excluded from the device entirely. The device is not limited to using a bezel **107** to attach the gadgets; the plurality of pieces **104** or the one or more wires **102** may be adapted to attach to the gadgets.

In one embodiment, rotation of the bezel **107** results in rotation of the cog **414** and hence, rotation of the ratchet **310**. The spool **312** is coupled to the ratchet **310**, and rotates simultaneously with the ratchet **310**. The one or more wires **102** then wind around the spool **312**, reducing the space between at least two pieces of the plurality of pieces **104**. If the plurality of pieces **104** are coupled together to form a wristband **101**, the diameter of the wristband **101** is reduced. The space between all pieces of the plurality of pieces **104** may be reduced. The plurality of pieces **104** may be excluded from the device, in which case the length of the one or more wires **102** extending out from the housing **106** would be reduced as the wire **102** is wound around the spool **312**. It is

to be understood the device **100** is not limited to being a device worn on the wrist. Rather, the device **100** may be used to secure any object to another object.

FIG. **5** illustrates a release mechanism **500**, according to one embodiment. Release mechanism **500** comprises a pawl **520**, a spring **522** to bias the pawl **520**, and a release button **518** adapted to actuate the pawl **520**. As the bezel **107** (shown in FIG. **4**) is rotated, the pawl **520** engages the teeth of the ratchet **310**, acting as a locking mechanism. The spring **522** is located between the housing **106** (shown in FIG. **4**) and the pawl **520**, and is in its relaxed state when the pawl **520** is engaging the teeth of the ratchet **310**. When the release button **518** is actuated, the spring **522** is compressed, and the pawl **520** disengages the teeth of the ratchet **310**. Once the pawl **520** is disengaged from the teeth of the ratchet **310**, the wire **102** unwinds from the spool **312**, spacing the plurality of pieces **104** apart, and increasing the diameter of the wristband **101** if the plurality of pieces **104** have been coupled together to form a band **101**. The release button **518** is partially exposed from the housing **106**. The release button **518** may be exposed from any side of the housing **106**, and the housing **106** may fully enclose the pawl **520** and the spring **522**. While described as being engaged with the ratchet **310**, it is contemplated that the release mechanism **500** may be engaged with the bezel **107**.

In one embodiment, the apparatus excludes the bezel **107** and the cog **414**. In this embodiment, the housing **106** encloses the ratchet **310** and the spool **312**, and the spool **312** is coupled to a surface of the ratchet **310**. The ratchet **310** has a center axis with which the spool **312** is rotatable about, and a plurality of teeth. One or more wires **102** are coupled to the spool **312**, and run through the center of at least two pieces of the plurality of pieces **104**. One end of the wire **102** may be fixedly coupled to an end piece of the plurality of pieces **104**. The plurality of pieces **104** are coupled together and to the housing **106**, and are spaced a distance apart. Rotation of the ratchet **310** results in the wire **102** being wound around the spool **312**, reducing the distance between at least two pieces of the plurality of pieces **104**. A pawl **520** is used to engage the teeth of the ratchet **310**, acting as a locking mechanism. A release button **518** may be present and adapted to disengage the pawl **520** from the teeth of the ratchet **310**, unlocking the system, and a spring **522** may be present to bias the pawl **520**. The plurality of pieces **104** may be coupled together to form a wristband **101**. The ratchet **310** may sit in a recess **311** which has a larger diameter than the ratchet **310**, and the edge of the recess **311** may prevent the wire **102** from contacting the teeth of the ratchet **310**. A portion of the ratchet **310** may be exposed from the housing **106**. The plurality of pieces **104** may be configured to receive attachments, such as a heart rate monitor or an MP3 player. The plurality of pieces **104** may comprise metal and may be linkage pieces.

In another embodiment, a tightening apparatus involves a planetary gear system **600**. The teeth of a bezel **607** interlock with the teeth of two planetary gears **624**, which in one example are identical planetary gears **624**. The two planetary gears **624** are operationally coupled by a central sun gear **610** that includes a plurality of teeth and a center axis. The teeth of the sun gear **610** are interlocked with the teeth of both planetary gears **624** to facilitate operational rotational there between. The planetary gears **624** in combination with the sun gear **610** act as part of the planetary gear system **600**. A spool **612** is coupled to a first surface of the sun gear **610** and is rotatable about an axis that is collinear with the center axis of the sun gear **610**. In one example, the spool **612** has a larger diameter than the sun gear **610**, and is mounted in a position that does not interfere with the rotation of the sun gear **610** or the planetary gears **624**. It is contemplated a gear ratio between the planetary gears **624** and the sun gear **610**, and the relative sizes of the planetary gears **624** and the sun gear **610**, may be adjusted to facilitate tailoring of the ease and speed of spooling the wire **102**.

FIG. **6**A illustrates the planetary gear system **600** according to one embodiment. FIG. **6**B is an expanded view of the planetary gear system **600**. The planetary gear system **600** may include the two planetary gears **624**, the sun gear **610**, and the spool **612** coupled to the sun gear **610**, all of which are fully enclosed in a housing **606**. Three posts **626** extend perpendicularly from the bottom of the housing **606** in a linear row. The two planetary gears **624** and the sun gear **610** rotate about the three posts, with the posts **626** disposed centrally through the gears. The center post shares a center axis with the sun gear **610**, and extends from the center of a circular recess **611** which is disposed on the bottom of the housing **606**. The spool **612** sits in the recess **611**, the recess **611** having a larger diameter than the spool **612**. A side wall of the recess **611** may have one or more cylindrical shafts or openings leading to the outside of a side wall of the housing **606**. Coupled to the spool **612** are one or more wires **102**, where the one or more wires **102** extend through the cylindrical shafts to the outside of the housing **606**. A plurality of pieces **104** are coupled to the outside of the housing **106**, and the one or more wires **102** continue to extend through the center of at least two pieces of the plurality of pieces **104**. The first piece of the plurality of pieces **104** is coupled to the housing adjacent the cylindrical shafts to facilitate alignment of the wire **102** from the spool **612**. A circular cover piece or press-fit lid with three circular openings therethrough may be used to prevent the components of the planetary gear system **600** from shifting in undesired directions. The three openings of the press-fit lid are positioned linearly with the three posts, and fit tightly over the three-posts so as the components of the planetary system **600** would be unable to shift under the press-fit lid.

In the embodiment shown in FIG. **6**A, rotation of the bezel **607** results in rotation of the sun gear **610** operatively coupled thereto through the planetary gears **624**. The spool **612** is coupled to the sun gear **610**, and rotates simultaneously with the sun gear **610**. The one or more wires **102** then wind around the spool **612**, reducing the space between at least two pieces of the plurality of pieces **104**. If the plurality of pieces **104** are coupled together to form a loop or wristband, the diameter of the loop or wristband is reduced. In the embodiment shown in FIGS. **6**A-**6**B, the bezel **607** has two sets of teeth. One on the outer diameter of the bezel **607** and another on the inner diameter of the bezel **607**. It is to be understood that the teeth on the outer diameter need not be present.

In the embodiment shown in FIGS. **6**A-**6**B, the housing **606** may contain a second recess **630** which extends to the edge of the housing **606** and remains spaced from the first recess **611**. In the second recess **630** lies a spring biased linear stopper piece **628**, where the linear stopper piece **628** is disposed between a spring **622** and the bezel **607**. The linear stopper piece **628** extends through an opening to the outside of the housing **606**, where an exposed portion of the linear stopper piece **628** acts as a release button **618**. The linear stopper piece **628** engages the teeth of the inner diameter of the bezel **607**, allowing rotation in only one direction, and prevents the wire **102** from unspooling. The spring **622** is also disposed in the second recess **630** between the linear stopper piece **628** and the back wall of the second recess **630**, and is in a relaxed state when the linear stopper piece **628** engages the teeth of the bezel **607**. When the release button **618** is actuated, the spring **622** is compressed, and the linear stopper piece **628** disengages from the teeth of the bezel **607**. Once the linear stopper piece **628** is disengaged from the teeth of the

bezel **607**, the wire **102** unwinds from the spool **612**, and the plurality of pieces **104** are spaced apart. If the plurality of pieces **104** were coupled together to form a wristband, the diameter of the wristband is increased.

In the embodiment shown in FIGS. **6**A-**6**B, the top side of the bezel **607** facing outward from the housing **606** may have a raised portion patterned with grooves to making gripping the bezel **607** easier. The bezel **607** may also be coupled to a watch **100** and a watch face **108**, where the watch **100** would be disposed on the press-fit lid. The bezel **607** may be coupled to any gadget, such as a heart rate monitor or an MP3 player, and is not limited to a watch **100**. It is to be understood the device is not limited to being a device worn on the wrist. The bezel **607** may be coupled to a perpendicular cog **414**, in which case the cog **414** would be coupled to one of the planetary gears **624**. The plurality of pieces **104** coupled to the housing **606** may comprise metal, and may be linkage pieces. The plurality of pieces **104** may be coupled to the housing **606** on both ends to form a wristband, or the plurality of pieces **104** may be coupled at only one end to the housing **106**. Any number of wires **102** may be coupled to the spool **612**, and any number of openings or cylindrical shafts may be formed in the side wall of the housing **606** to allow the wires **102** to linearly run through the plurality of pieces **104**. The spool **612** may have a greater diameter than the sun gear **610**. The plurality of pieces **104** may be excluded from the device, and the one or more wires **102** may be adapted to attach the gadgets.

The linear stopper piece **628** is shown in FIG. **7**. The linear stopper piece **628** comprises two asymmetrical rounded cut-outs **732**. As the bezel **607** is rotated, the two asymmetrical rounded cut-outs **732** of the linear stopper piece **628** engage the teeth of the bezel **607**, allowing rotation of the bezel **607** in only one direction until the release button **618** is actuated. The cut-outs **732** are rounded so as to engage the teeth of the bezel **607**, and are asymmetric to prevent over tightening of the apparatus. If the bezel **607** is rotated too much, resulting in the over tightening of the apparatus, the asymmetrical cut-outs **732** allow for the linear stopper piece **628** to slip back in between the previous set of teeth of the bezel **607**, thus loosening the apparatus. The prevention of over tightening the apparatus is a safety precaution, and is in place to help prevent a band embodiment from cutting off circulation to the hand or any other negative effects over tightening the apparatus may cause.

FIG. **8** illustrates one embodiment of the invention in which a tightening apparatus **800** is spaced a distance apart from a device **834**. A housing **806** is coupled to a plurality of pieces **104** and encloses a ratchet **810**. The ratchet **810** is partially exposed from the housing, and a spool **312** (shown in FIG. **3**) is coupled to a surface of the ratchet **810**. The ratchet **810** has a center axis with which the spool **312** is rotatable about, and a plurality of teeth. One or more wires **102** are coupled to the spool **312**, and run through the center of the plurality of pieces **104**. The plurality of pieces **104** and/or the one or more wires **102** are coupled to a device **834**, and the device **834** is separated from the housing **806** by the plurality of pieces **104** and the one or more wires **102**, such that the device **834** and the housing **806** are in a spaced apart relation. Rotation of the ratchet **810** results in the wire **102** being wound around the spool **312**, reducing the distance between at least two pieces of the plurality of pieces **104**. The plurality of pieces **104** and the one or more wires **102** may be coupled together to form a band **101**, as shown in the figure. The housing **806** may also include a cog **414** (shown in FIG. **4**) and/or a bezel **107** (shown in FIG. **4**). The tightening apparatus **800** is not limited to including the ratchet **810**, and may include the planetary gear system **600** as shown in FIG. **6**. The linear stopper piece **628** of FIG. **7** may be included in the housing **806**, or the release mechanism shown in FIG. **5** may be included in the housing **806**. The device **834** is not limited to being a watch as shown, but may be any device, such as a GPS or a heart rate monitor, and is not limited to being a device **834** worn on the wrist.

While the foregoing is directed to embodiments of the present invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof, and the scope thereof is determined by the claims that follow.

The invention claimed is:

1. A tightening apparatus, comprising:

a housing, wherein a bezel is coupled to the housing and to a perpendicular cog, and wherein the cog is coupled to the ratchet;

a ratchet having a center axis;

a spool coupled to the ratchet, wherein the spool is rotatable about an axis that is collinear with the center axis; and

one or more wires coupled to the spool and extending out from the housing, wherein the one or more wires are configured to wind around the spool when the spool rotates, and wherein the length of the one or more wires extending from the housing is adjustable with rotation of the spool.

2. The tightening apparatus of claim **1**, further comprising a plurality of pieces are coupled to the housing and the one or more wires, wherein the one or more wires form a closed loop.

3. The tightening apparatus of claim **2**, wherein the plurality of pieces comprise metal.

4. The tightening apparatus of claim **2**, wherein one end of the one or more wires is fixedly coupled to an end piece of the plurality of pieces.

5. The tightening apparatus of claim **1**, further comprising a locking mechanism coupled to the housing and movable into and out of contact with the ratchet.

6. The tightening apparatus of claim **1**, wherein the ratchet sits in a recessed circle, the recessed circle having a larger diameter than the ratchet, and the edge of the recessed circle prevents the one or more wires from contacting the ratchet.

7. The tightening apparatus of claim **1**, wherein the spool extends perpendicularly from a surface of the ratchet.

8. The tightening apparatus of claim **1**, wherein the housing encloses the ratchet and the spool, and wherein the housing is in a spaced apart relation from a device coupled to the one or more wires.

9. A tightening apparatus, comprising:

a housing;

a plurality of pieces coupled together and to the housing;

a central sun gear having a center axis and a plurality of teeth, wherein the sun gear is enclosed in the housing;

two planetary gears coupled to the sun gear, wherein the planetary gears have a plurality of teeth and are enclosed in the housing;

a bezel having a plurality of teeth on an inner diameter of the bezel, wherein the teeth of the bezel are interlocked with the teeth of the two planetary gears, wherein the bezel is coupled to a perpendicular cog,

and wherein the cog is coupled to one of the planetary gears;

a spool coupled to the sun gear, wherein the spool is rotatable about an axis that is collinear with the center axis of the sun gear; and

one or more wires coupled to the spool and at least a second piece of the plurality of pieces, wherein the one or more

wires are configured to wind around the spool when the spool rotates, wherein the second piece is movable from a first position spaced a first distance from a first piece of the plurality of pieces to a second position spaced a second distance from the first piece, and wherein the second distance is less than the first distance.

10. The tightening apparatus of claim **9**, wherein the spool is disposed in a recess, the recess allowing the sun gear and the two planetary gears to rotate without interference.

11. The tightening apparatus of claim **9**, wherein the housing has at least one opening formed through a side wall thereof.

12. The tightening apparatus of claim **11**, further comprising an asymmetrical spring biased linear stopper piece extending through the opening in the housing, the stopper piece prevents the bezel from rotating by engaging the teeth of the bezel, and wherein the portion of the asymmetrical spring biased linear stopper piece extends from the housing.

13. The tightening apparatus of claim **12**, wherein the portion of the asymmetrical spring biased stopper piece extending from the housing can be actuated to disengage the teeth of the bezel.

14. The tightening apparatus of claim **11**, wherein the housing has at least two openings formed through a side wall, and wherein the one or more wires extend through at least one of the openings.

15. The tightening apparatus of claim **9**, further comprising a cover piece coupled to posts that extend through the gears.

16. The tightening apparatus of claim **9**, wherein the plurality of pieces are coupled together to form a wristband, the wristband having an adjustable diameter.

17. The tightening apparatus of claim **9**, wherein the housing is in a spaced apart relation from a device coupled to the one or more wires.

18. A tightening wristwatch, comprising:

a housing having a plurality of pieces coupled together;

a ratchet having a center axis and coupled to at least a first piece of the plurality of pieces and a last piece of the plurality of pieces, wherein the ratchet has a plurality of teeth;

a spool coupled to the ratchet, wherein the spool is rotatable about an axis that is collinear with the center axis;

a cog perpendicular to the ratchet, wherein the teeth of the cog and the teeth of the ratchet are interlocked;

a bezel coupled to the cog and disposed perpendicular to the cog and parallel with the ratchet, wherein the cog and bezel are interlocked;

a watch coupled to the bezel, wherein the watch is coupled to the plurality of pieces to form a closed loop; and

one or more wires coupled to the spool and at least a second piece of the plurality of pieces, wherein the one or more wires are configured to wind around the spool when the spool rotates, wherein the second piece is movable from a first position spaced a first distance from the first piece to a second position spaced a second distance from the first piece, wherein the second distance is less than the first distance, and wherein the diameter of the loop is reduced.

19. The tightening wristwatch of claim **18**, further comprising a spring biased pawl adapted to engage the teeth of the ratchet.

20. The tightening wristwatch of claim **19**, further comprising a release button adapted to disengage the pawl from the teeth of the ratchet.

21. The tightening wristwatch of claim **18**, wherein the one or more wires run though each piece of the plurality of pieces.

22. The tightening wristwatch of claim **18**, wherein the housing encloses the ratchet, the spool, and the cog.

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